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FAULK, DEVONA E				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

09/728,215

Applicant(s)

BIZJAK, KARL M.

Examiner

DEVONA E. FAULK

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/1/09 - examiner interview.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 12-23, 25-47, 50, 51, 54-81, 89-93, 118, 121-123 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 12-16, 18, 19, 21, 25, 34-49, 51, 54-60, 63-72, 75, 76, 89-93, 122, 123 is/are rejected.
- 7) ☒ Claim(s) 2, 4, 5, 17, 20, 22, 23, 26-33, 50, 61, 62, 73, 74, 77-81, 118 and 121 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. The examiner had an with the applicant's representative on 3/24/09. The applicant pointed out some inconsistencies in the previous office action. The examiner agreed to do a supplemental action to correct the inconsistencies.
2. Applicant's arguments, regarding the newly recited claim language, filed 5/27/08, with respect to the rejection(s) of claim(s) 1 and 16 under 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Suzuki et al. (US 5,251,262) and 112 2nd rejection.
3. Applicant's arguments, regarding the newly recited claim language, filed 5/27/08, with respect to the rejection(s) of claim(s) 51 and 55 under 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Slater.
4. **Applicant's arguments, regarding the claim objection of claims 2-4,5,38,50,118,121 filed 5/27/08, with respect to the claim objections of claims 2-4, 5,38,50,118,121 have been fully considered and are persuasive. The claim objections of claims 2-4, 5,118,121 has been withdrawn.**
5. **Applicant's arguments, regarding the 112 rejection of claims 16-18,21,25 filed 5/27/08, have been fully considered and are persuasive. The 112 rejections of claims 16-18,21 and 25 have been withdrawn.**

6. The indicated allowability of claim 47 is withdrawn in view of the newly discovered reference(s) to Suzuki. Rejections based on the newly cited reference(s) follow. This action is made non-final for this reason.
7. Claims 36 and 37 are cancelled. Claims 6-11,48,49,82-88,94-117,119 and 120 are withdrawn from consideration

Claim Objections

8. **Claims 2,4,5,17,20,22,23,26-33,50,61,62,73,74,77-81,118,121** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. **Claims 1,3,14-16,18,35,45-47,123** are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al. (US 5,251,262).

Regarding **claim 1**, Suzuki discloses a noise extraction method (Figure 3; column 2, lines 40-65; Figure 3) comprising the steps of:

providing an environmental input which includes a noise indicia (microphone 20, Figure 3; column 5, lines 55-59),

selectively modifying the environmental input in accordance with an algorithm based on a time response, amplitude of response comprising at least two components of a group including delay, converge and slow response (the modifying step is comprised of the delay 18 and adaptive controller 19 and inverse filter 22 of Figure 3, the delay 18 and adaptive controller 19 comprise one time algorithm and the inverse filter 22 comprises another time algorithm; the adaptive controller 19 having convergence; algorithm is defined as procedure for solving a mathematical problem in a finite number of steps ; column 5, lines 28-35; column 6, lines 16-39)

generation an output, whereby the output modifies a system gain (output of adaptive controller 19 is fed to speaker 17 and serves to modify a system gain; column 6, lines 16-39).

All elements of claims 3 and 14 are comprehended by the rejection of claim 1 (microphone 20 produces an analog signal).

Regarding claim 15, Suzuki teaches of wherein the step of selectively modifying the environmental input includes multiple instances of modifying in accordance with the selected algorithm (adaptive controller 19 adaptively modifies; column 5, lines 45-50).

All elements of claim 35 are comprehended by the rejection of claim 1 (Suzuki teaches of a microphone).

Regarding **claims 45-47**, Suzuki teaches of a plurality of time algorithms and combining at least some results of the algorithms (the outputs of the inverse filter is added to the output of the adaptive controller; regarding the plurality of time algorithms see Suzuki as applied above to claim 1).

Regarding **claim 123**, Suzuki discloses providing a noise sensitivity control signal and modifying the environmental input based on the noise sensitivity control signal (output of inverse filter reads on noise sensitivity control signal, Figure 3; column 5, line 5- column 6, line 45). It is implicit that the environmental input modifies the signal-to-noise ration of a system output.

Regarding **claim 16**, Suzuki discloses a noise extraction method (Figure 3; column 2, lines 40-65; Figure 3) comprising the steps of:

providing an environmental input which includes a noise indicia (microphone 20, Figure 3; column 5, lines 55-59),

selectively modifying the environmental input in accordance with an algorithm based on a time response, amplitude of response comprising at least two components of a group including delay, converge and slow response the modifying step is comprised of the delay 18 and adaptive controller 19 and inverse filter 22 of Figure 3, the delay 18 and adaptive controller 19 comprise one time algorithm and the inverse filter 22 comprises another time algorithm; the adaptive controller 19 having convergence; algorithm is defined as procedure for solving a mathematical problem in a finite number of steps ; column 5, lines 28-35; column 6, lines 16-39)

generation an output accordingly (output of adaptive controller 19 is fed to speaker 17 and serves to modify a system gain; column 6, lines 16-39)

the step of selectively modifying the environmental input includes modifying the environmental input in accordance with a plurality of such algorithms (modification is done based on delay and the adaptive controller 19 of Figure 3).

Regarding claim 18, Suzuki teaches of combining at least some results of the algorithms (the outputs of the inverse filter is added to the output of the adaptive controller, See Suzuki as applied above to claim 16).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claim 12** is rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki et al. (US 5,251,262) as modified by Zurek et al.(US 4,956,867).

Regarding claim 12,Suzuki discloses an environmental input. Suzuki fails to disclose that the environmental input comprises a plurality of environmental sub-inputs. Zurek discloses an environmental input comprised of environmental sub-inputs (Figures 1,2,4 ; microphones 12a,12b of Figures 1 and 2 and microphones 821-82m of Figure 4). It would have been obvious to modify Suzuki so that the environmental input comprises

a plurality of environmental sub-inputs in order to receive an input signal having target and noise signal components (Zurek, column 2, lines 28-30).

13. **Claims 13,19 and 122** is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 5,251,262).

Regarding **claim 13**, Suzuki discloses wherein the environmental input is an analog signal. Suzuki fails to disclose that the environmental input is a digital signal. The examiner takes official notice that digital signals or digital processing is known in the art. It would have been obvious to modify Suzuki so that the environmental input is digital in order to provide a higher quality sound at the output.

Regarding **claim 19**, the examiner takes official notice that a plurality of outputs is well known in the art.

Regarding **claim 122**, Suzuki discloses using an adaptive filter. Suzuki fails to disclose that the filter is a low pass filter. The examiner takes official notice that low pass filters are well known in the art and it would have been obvious to have the filter be a low pass filter for the benefit of only passing or outputting a signal in the low frequency range.

14. **Claims 25,59,60 and 62** are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (hereafter AAPA) (Figure 2, page 4- page 5) in view of Markevich (US 3,701,028).

Regarding claim 25, AAPA discloses a noise extraction method comprising the steps of:

providing a reference signal (speaker Figure 2, page 4);

providing an environmental input which includes noise indicia with a small noise fluctuation amplitude (Figure 2);

determining the difference between the environmental input and the reference signal to generate a feedback signal (Figure 2),

modifying one signal of a group comprising the environmental input and the reference signal to minimize the difference to correct for the small noise fluctuation amplitude (Figure 2, page 4), and

generating a modified output signal in accordance therewith (Figure 2).

AAPA discloses generating a positive feedback signal. AAPA fails to teach of a negative feedback.

The examiner takes official notice that a positive or negative feedback signal is well known in the art (A positive feedback signal is one that increases the gain and a negative feedback is one that decreases the output). It would have been obvious to one of ordinary skill in the art to modify the AAPA generate a negative feedback signal in order to decrease the output signal and provide a more stable system.

AAPA as modified fail to teach that the feedback is limited negative feedback. Markevich discloses a limited negative feedback (Figure 2, column 3, lines 14-column 4, line 11). It would have been obvious to modify AAPA as modified so that the feedback is a limited negative feedback for the benefit of better reduce distortion of signals.

All elements of **claims 59,60 and 62** are comprehended by the rejection of claim 25 (See AAPA and Markevich as applied to claim 25 above and AAPA teach of processing using filtering on page 4).

15. **Claims 34,38-41** is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 5,251,262) in view of Kates (US 6,072,884).

Regarding claim 34, Suzuki fails to disclose a plurality of environmental inputs and combining a plurality of environmental inputs into a primary environmental input.

Kates discloses that signals from two or more microphones are combined to form audio signal 504 (Figure 5; column 10, lines 62-65; column 11, lines 11-20). It would have obvious to modify Suzuki to include a plurality of environmental inputs and combining the inputs into a primary environmental input to allow adaptive directional microphone processing.

Regarding **claim 38**, Suzuki discloses a noise extraction method (Figure 3; column 2, lines 40-65; Figure 3) comprising the steps of:

providing an environmental input which includes a noise indicia (microphone 20, Figure 3; column 5, lines 55-59),

selectively modifying the environmental input in accordance with an algorithm based on a time response, amplitude of response comprising at least two components of a group including delay, converge and slow response (algorithm is defined as procedure for solving a mathematical problem in a finite number of steps ; the delay 18 and adaptive controller 19 of Figure 3 comprise the time algorithm; the adaptive controller 19 having convergence; column 5, lines 28-35; column 6, lines 16-39)

generation an output, whereby the output modifies a system gain (output of adaptive controller 19 is fed to speaker 17 and serves to modify a system gain; column 6, lines 16-39).

Suzuki fails to disclose a plurality of environmental inputs and combining a plurality of environmental inputs into a primary environmental input.

Kates discloses that signals from two or more microphones are combined to form audio signal 504 (Figure 5; column 10, lines 62-65; column 11, lines 11-20). It would have obvious to modify Seligman to include a plurality of environmental inputs and combining the inputs into a primary environmental input to allow adaptive directional microphone processing.

All elements of **claims 39-41** are comprehended by the rejection of claim 38 (See Figures 5 and 6; Figure 6 discloses an embodiment wherein the signal processing is performed separately for each environmental input).

16. **Claim 44** is rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki et al. (US 5,251,262).

Regarding **claim 44**, Suzuki teaches of a time response algorithm. Suzuki fails to disclose that the time response algorithm includes variable attack and release. The examiner takes official notice that variable attack and release algorithms are known in the art. It would have been obvious to modify Suzuki so that the time response algorithm includes variable attack and release so that modifying the environmental input could be done dynamically.

17. **Claims 51-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over Germer (US 4,628,526) in view of Helms (US 5,666,426) in further view of Slater (US 5,666,426).

Regarding **claim 51**, Germer discloses a noise extraction method comprising the steps of:

Providing a reference input indicative of output power level (output of speaker 10, Figure 1),

Providing an environmental input which includes a noise indicia (microphone 11, Figure 1),

Generating an indication of noise power level in response to the environmental input (envelope curve signal, see abstract; column 5, lines 15-35),

Comparing the reference input to the indication of noise power level (abstract; column 5, lines 15-35),

Selectively modifying system gain in accordance with compare step (abstract; column 5, lines 15-55).

Germer fails to disclose providing a noise sensitivity control signal for modifying the signal-to-noise ration of system output. Helms discloses an automatic volume control to compensate for ambient noise variations including a volume control which controls the volume of sound that is output by the system (22, Figure 1; column 2, lines 49-55) and a microphone (12) that receives the total ambient sound including the output from the speaker (column 2, lines 62-65). Whenever the volume control is used the signal-to-noise ratio is implicitly modified.

It would have been obvious to modify Germer to include a volume control that controls the volume of sound output by the system in order to provide manual control over the system output.

Germer as modified fails to explicitly teach that the noise power level is adjusted response to a noise sensitivity control signal. Slater teaches of a noise power level that is adjusted based on a sensitivity control signal (column 5, lines 27-34). It would have been obvious to modify Germer as modified so that the noise power level is adjusted in response to a sensitivity control signal in order to enhance voice intelligibility.

All elements of **claim 54** are comprehended by the rejection of claim 51.

18. **Claims 21,42,43,68** are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (hereafter AAPA) (Figure 2, page 4-page 5) in view of Humphrey (US 4,306,115) in view of Markevich (US 3,701,028).

Regarding **claim 21**, AAPA discloses a method for correction for small noise fluctuation including the steps of

providing at least one environmental input having a noise indicia with a small noise fluctuation amplitude (microphone, Figure 2),

providing at least one reference input (speaker Figure 2, page 4),
determining the difference between the environmental input and the reference input to generate a feedback signal (Figure 2),

converting the feedback signal to a gain offset to correct for the small noise fluctuation (Figure 2, page 4).

AAPA fails to disclose the gain having a predetermined maximum and minimum. Humphrey discloses the concept of gain that has a predetermined minimum and maximum (column 3, lines 17-19). It would have been obvious to modify the AAPA so that the gain has a predetermined maximum and minimum in order to provide a operating or working range for the user.

AAPA as modified teaches of a positive feedback. AAPA as modified fails to teach of a negative feedback. The examiner takes official notice that negative feedback and its benefits are well known in the art. It would have been obvious to modify AAPA as modified so that the feedback is negative to provide a more stable system.

AAPA as modified fail to teach that the feedback is limited negative feedback. Markevich discloses a limited negative feedback (Figure 2, column 3, lines 14-column 4, line 11). It would have been obvious to modify AAPA as modified so that the feedback is a limited negative feedback for the benefit of better reduce distortion of signals.

All elements of **claim 42 and 43** are comprehended by the rejection of claim 21.

All elements of **claim 68** are comprehended by the rejection of claim 21 (See AAPA as applied to claim 21 above and AAPA teach of processing using filtering on page 4).

19. **Claim 55** is under 35 U.S.C. 103(a) as being unpatentable over Germer (US 4,628,526) in view of view of Shen (US 5,416,845) in view of Helms (US 5,666,426) in further view of Slater (US 5,666,426).

..

Regarding **claim 55**, Germer discloses a noise extraction method comprising the steps of:

Providing a reference input indicative of output power level (output of speaker 10, Figure 1),

Providing an environmental input which includes a noise indicia (microphone 11, Figure 1),

Generating an indication of noise power level in response to the environmental input (envelope curve signal, see abstract; column 5, lines 15-35),

Comparing the reference input to the indication of noise power level (abstract; column 5, lines 15-35),

Selectively modifying system gain in accordance with compare step (abstract; column 5, lines 15-55).

Germer fails to disclose that the reference input includes a plurality of inputs.

Shen discloses wherein a reference input includes a plurality of reference inputs (Figure 6, column 15, lines 12-26, Figure 1B).

The prior art, as evidenced by Shen discloses a plurality of reference inputs. It would have been obvious to try the known method of noise extraction with a plurality of reference signals in order to provide a multichannel system.

Germer as modified fails to disclose providing a noise sensitivity control signal for modifying the signal-to-noise ratio of system output. Helms discloses an automatic volume control to compensate for ambient noise variations including a volume control which controls the volume of sound that is output by the system (22, Figure 1; column 2, lines 49-55) and a microphone (12) that receives the total ambient sound including the output from the speaker (column 2, lines 62-65). Whenever the volume control is used the signal-to-noise ratio is implicitly modified.

It would have been obvious to modify Germer to include a volume control that controls the volume of sound output by the system in order to provide manual control over the system output.

Germer as modified fails to explicitly teach that the noise power level is adjusted response to a noise sensitivity control signal. Slater teaches of a noise power level that is adjusted based on a sensitivity control signal (column 5, lines 27-34). It would have been obvious to modify Germer as modified so that the noise power level is adjusted in response to a sensitivity control signal in order to enhance voice intelligibility.

20. **Claim 56-58** are rejected under 35 U.S.C. 103(a) as being unpatentable over Germer (US 4,628,526) in view of Shen (US 5,416,845) in view of Helms (US 5,666,426) in view of Slater (US 5,666,426) in further view of Kates (US 6,072,884).

Regarding claims 56-58, Germer as modified discloses an environmental and reference input. Germer as modified fails to disclose combining at least some of the plurality of reference inputs to generate overall indication of output level (claim 56); a

plurality of environmental inputs (claim 57); combining at least some of the plurality of inputs to generate an overall indication of noise (claim 58)

Kates discloses that signals from two or more microphones are combined to form audio signal 504 (Figure 5; column 10, lines 62-65; column 11, lines 11-20). It would have obvious to modify Germer to include a plurality of environmental inputs or reference inputs and combining the inputs to allow adaptive directional microphone processing.

21. **Claims 63-67,69,71,72,75,76** are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (hereafter AAPA) (Figure 2, page 4-page 5) in view of Humphrey (US 4,306,115) in view of Markevich (US 3,701,028) in further view of Kates (US 6,072,884).

Regarding claims 63-67, AAPA as modified discloses an environmental and reference input. AAPA as modified fails to disclose wherein at least one of the steps of providing at least one environmental input and at least one reference input includes providing a plurality of such inputs.

Kates discloses that signals from two or more microphones (Figure 5; column 10, lines 62-65; column 11, lines 11-20). It would have obvious to modify AAPA as modified to include a plurality of environmental inputs to allow adaptive directional microphone processing.

All elements of claim 64-67,69 are comprehended by the rejection of claim

Claims 71,72 and 75 are rejected using AAPA, Humphrey, Markevich and Kates as applied above to claims 21 and 63 (See AAPA as applied to claim 21 above and AAPA teach of processing using filtering on page 4).

Regarding claim 76, the examiner takes official notice that generating a modified output is well known. It would have been obvious to modify AAPA as modified so a modified output signal is generated for at least some of the associated ones in order to compensate for noise in the associated ones.

22. **Claim 70** is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (hereafter AAPA) (Figure 2, page 4-page 5)) in view of Markevich (US 3,701,028) in further view of .Kates (US 6,072,884)..

AAPA as modified fails to disclose a plurality of environmental inputs .

Kates discloses that signals from two or more microphones (Figure 5; column 10, lines 62-65; column 11, lines 11-20). It would have obvious to modify AAPA as modified to include a plurality of environmental inputs to allow adaptive directional microphone processing.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVONA E. FAULK whose telephone number is (571)272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devona E. Faulk/
Primary Examiner, Art Unit 2614